

Identifying hotspots of biological nitrogen transformations in coastal waters affected by groundwater inputs

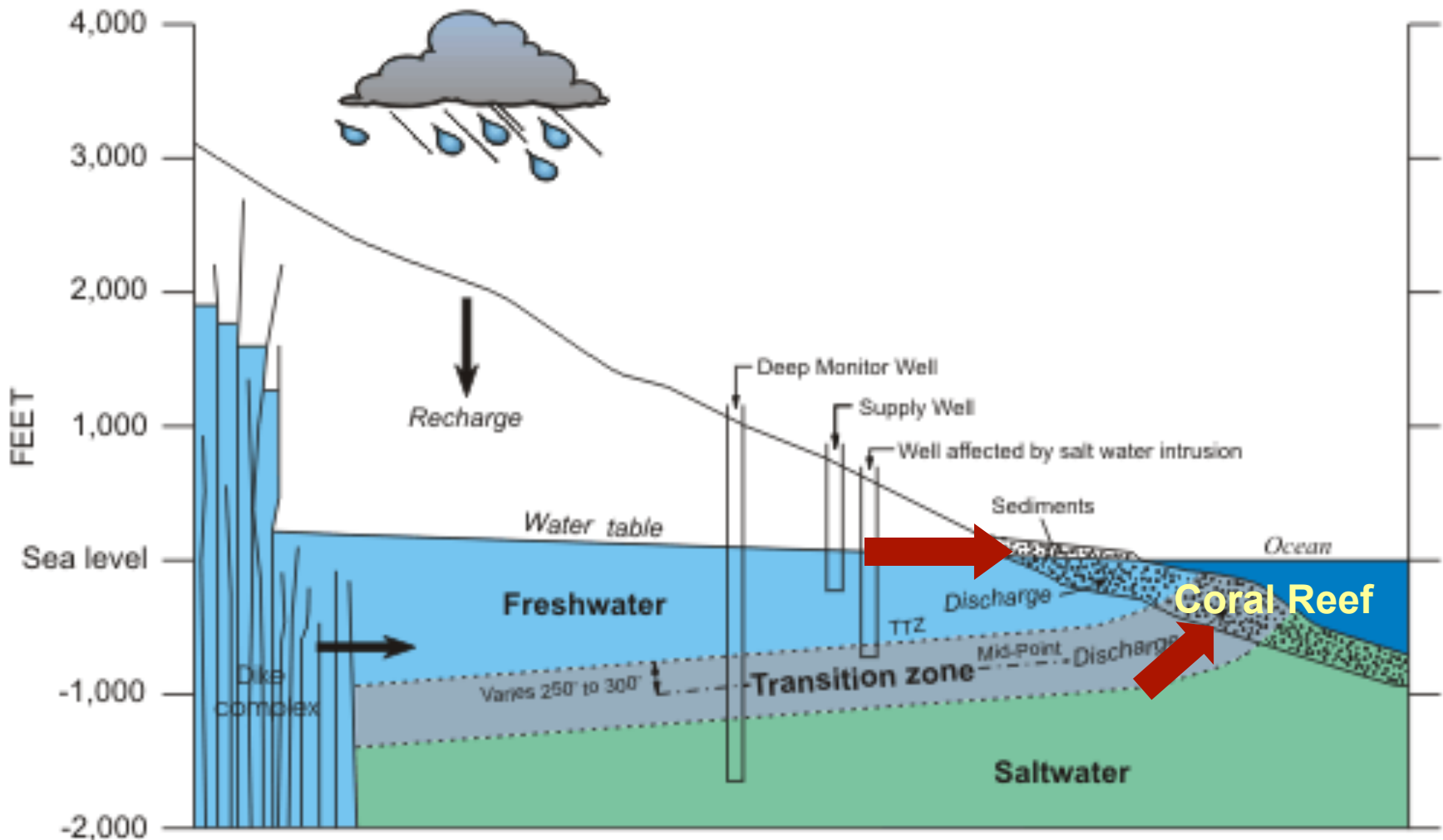
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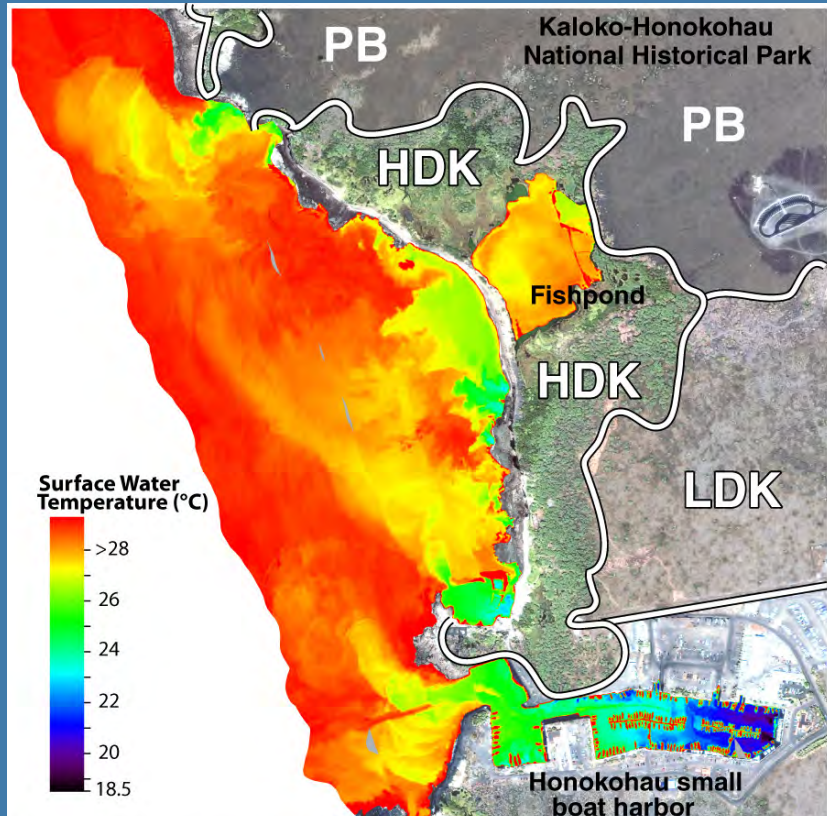
Groundwater is the predominant freshwater source to leeward coasts on the Hawaiian Islands



Preliminary Questions to Identify 'Hot Spots' of Biological Transformations

1. How do surface water dissolved nitrogen (N) concentrations vary spatially and temporally?
2. How do the relative percent contributions of N forms to the dissolved N pool vary spatially and temporally?
3. How do dissolved N concentrations change with depth and vary temporally?

Site: Kaloko-Honokōhau



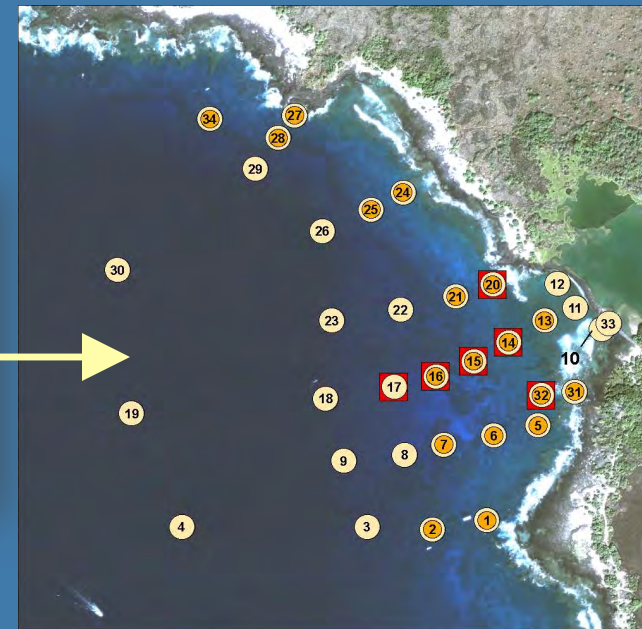
Aerial infrared imagery from C. Glenn.

Approach

1. Map surface water characteristics using a water quality sensor

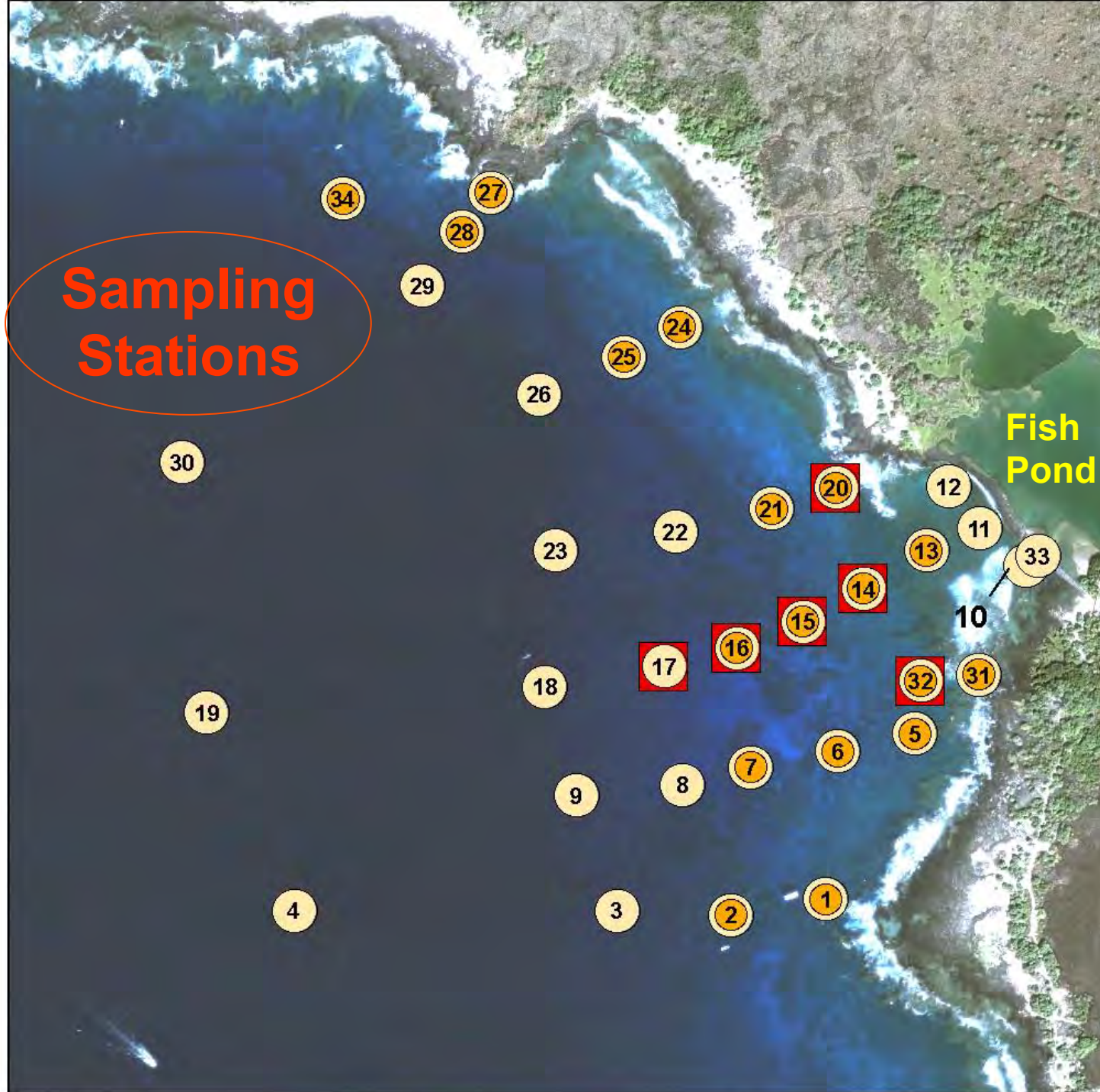


2. Collect pelagic and benthic water quality samples



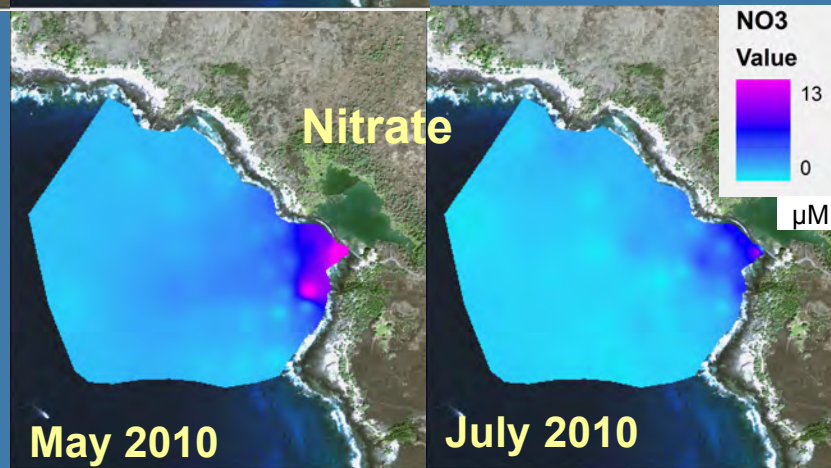
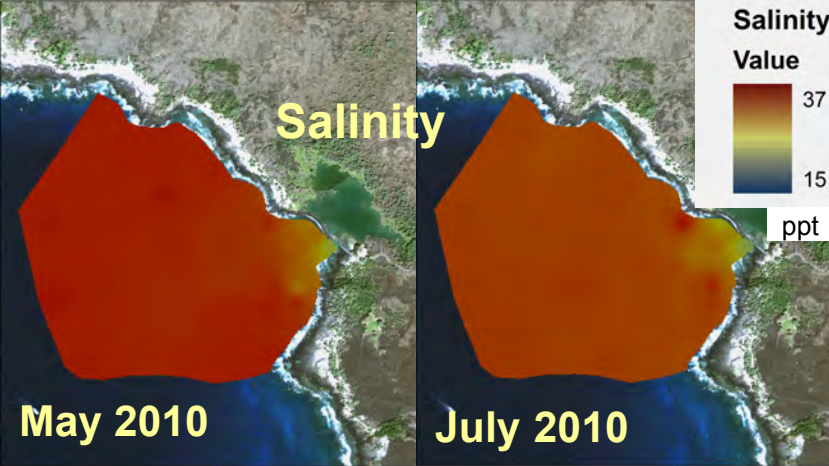
Sampling Stations

Fish Pond

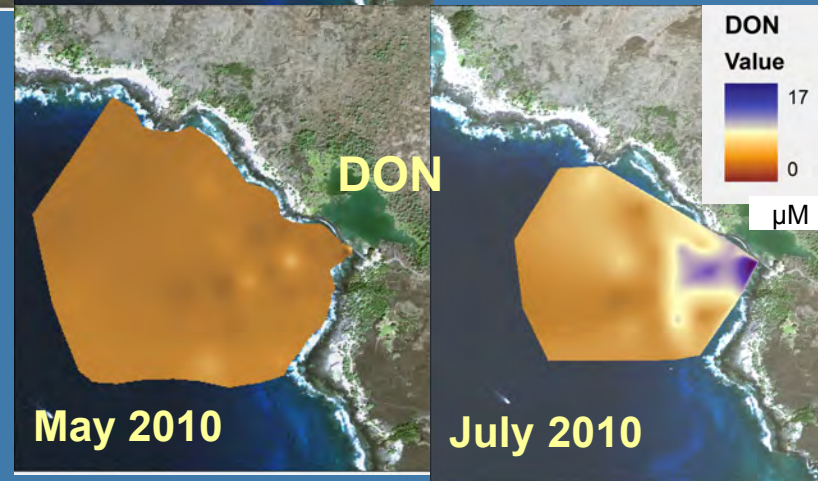


How do surface water dissolved N concentrations vary spatially and temporally?

High concentrations of NO_3^- & DON were found near the fish pond with low salinity waters



Concentrations & spatial patterns varied between months



How do the relative % contributions of dissolved N forms to the dissolved N pool vary spatially & temporally?

%DON increased offshore

%NO₃⁻ increased inshore

Relative percentages changed monthly, but spatial patterns were consistent

Changes occurred within 200 m of fish pond wall

MAY 2010

NO₃⁻
DON

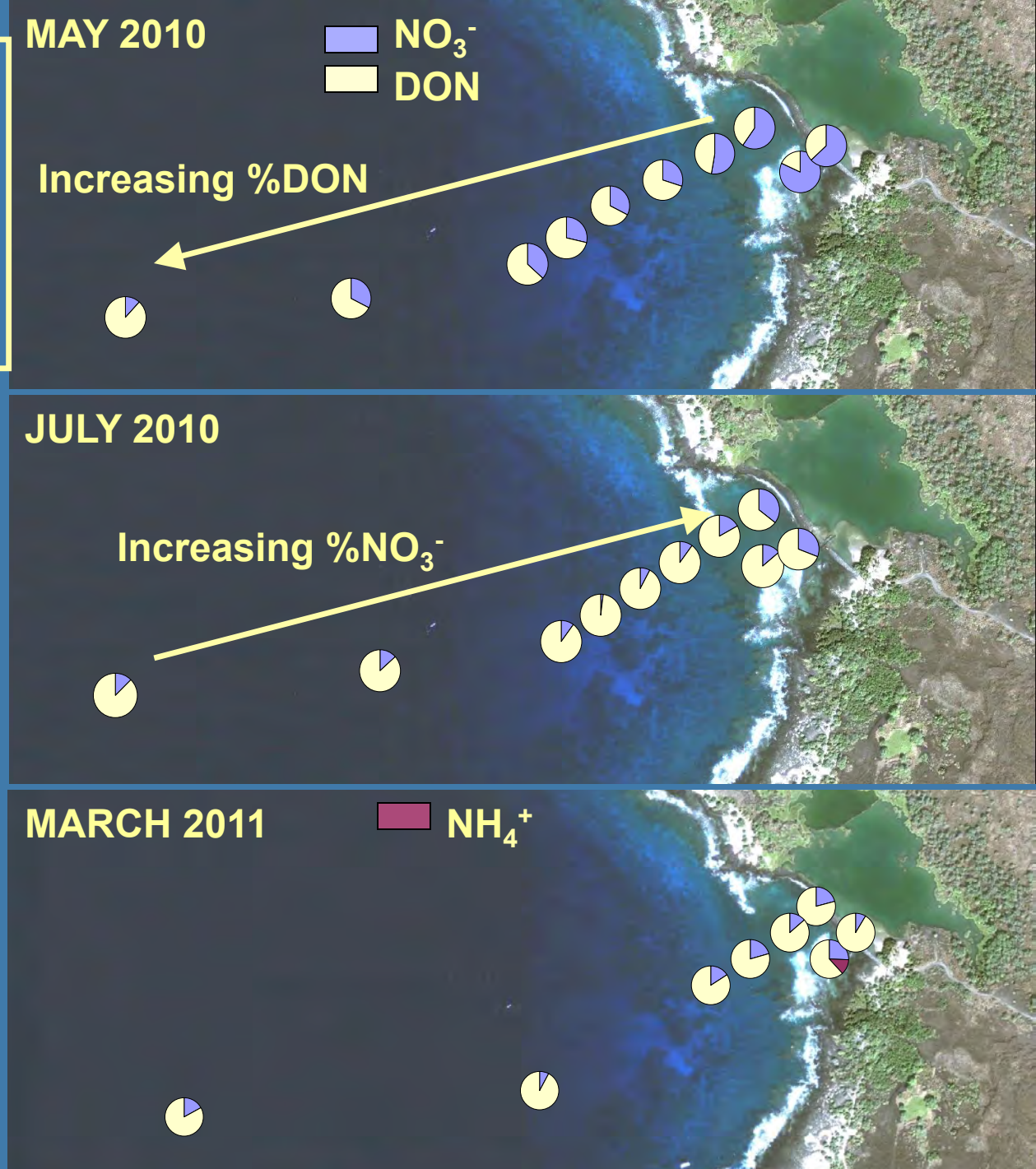
Increasing %DON

JULY 2010

Increasing %NO₃⁻

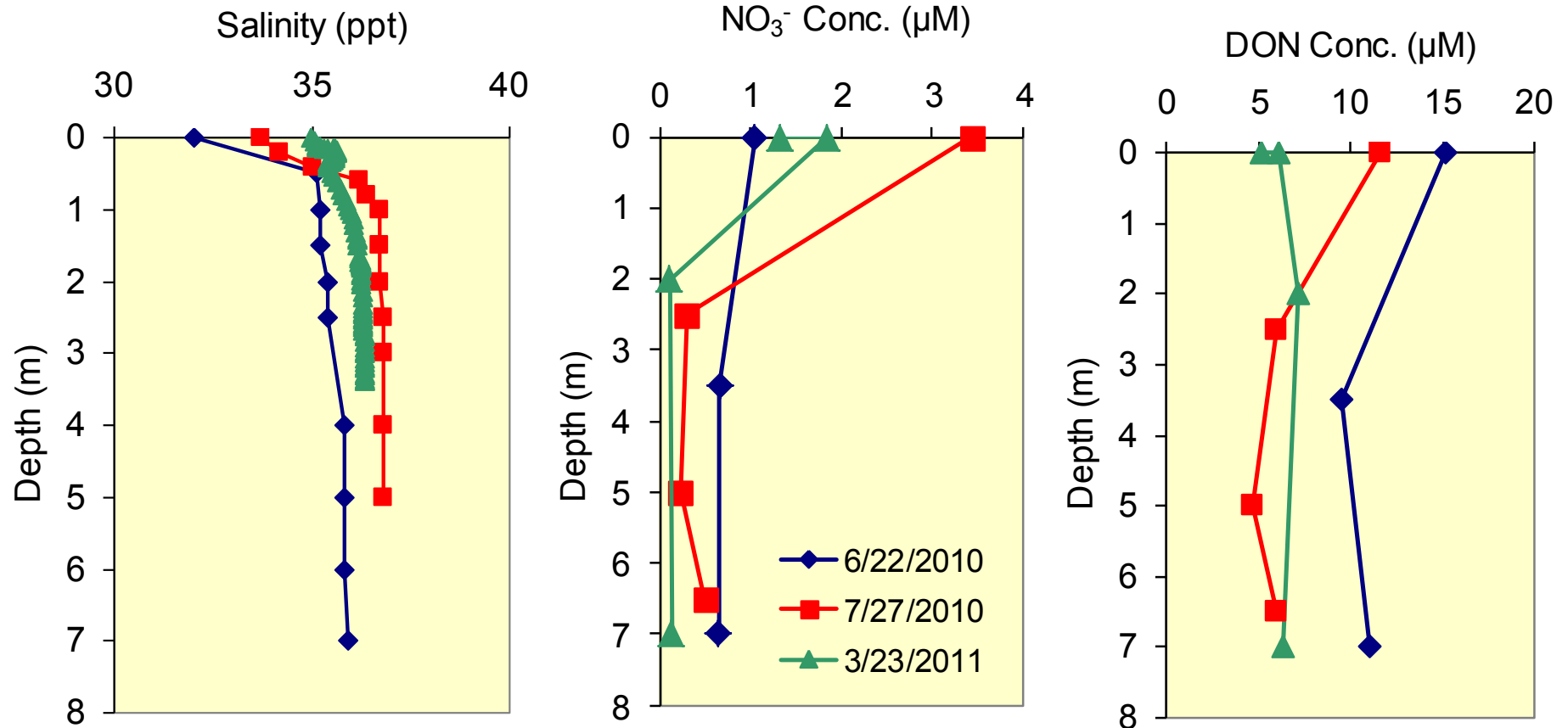
MARCH 2011

NH₄⁺



How do dissolved N concentrations change with depth & vary temporally?

Depth Profiles at Station 14



Concentrations decreased with depth & profile patterns were consistent between months

Thank you!

Gillian Wysock, Mauritius Bell, Jonatha Giddens,
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Kryss, Ambyr Mokiao-Lee, Nakoa Goo, Jackie Troller

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Sallie Beavers and Lindsay Cramer

